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THE AEDES (FINLAYA) ALBOTAENIATUS GROUP OF
MOSQUITOES

(DIPTERA, CULICIDAE)¹

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Edwards (1932) placed all of the species of *Aedes* (*Finlaya*) having the following characters in Group F (*albotaeniatu*s-group: *Danielsia*): (1) Hind tarsi with at least the first three segments basally white-banded (rarely one or more segments with a few apical white scales). (2) Neither femora nor tibiae lined anteriorly with pale scales for nearly their whole length. (3) Scutal markings various in type, or absent, but not consisting solely of a pattern of distinct thin longitudinal pale lines (*a. var. mikiranus* has three indistinct pale lines, but also possesses a white patch before the wings). This definition has created a very large group, containing many more or less unrelated forms. Consequently, in order to facilitate the identification of species belonging in Group F, some system of subdivisions is badly needed.

The discovery of an unnamed Philippine species of *Finlaya* belonging in Group F has led to a re-examination of all the species of the group, a study which was greatly facilitated by the opportunity to study nearly all of the types (most of which are in the British Museum).

As a result of this study, it is proposed here to subdivide Group F into eight divisions, which it is hoped represent more or less homogeneous groups of species. In addition, these divisions are defined and keyed.

All of the species included in Group F are either Oriental or Australasian, except for two American species: *zoosophus* Dyar and Knab and *knabi* Coquillett. The former can tentatively be placed in one of the divisions created here, but the latter species is impossible to place at present (the male being unknown).

Division I—*albotaeniatu*s s. str. Distinct because of the possession of a tuft of modified scales on the inner sternal membranous surface of the basistyle. Also: male palpi with the apex of segment III slightly up-

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turned, segments IV-V somewhat concave medially and both depressed from the plane of III, numerous long ventro-lateral hairs arising from the apex of III and all along IV and V; vertex with the dorsum largely covered with broad flat scales; scutal scales generally lying unevenly in some areas and consisting of more than one size scale, the margins of any pale scaled areas not sharply defined; hind tarsi with the first three to four segments with basal white bands, sometimes a very few apical white scales on one or more segments; femora not sprinkled with pale scales anteriorly; and, Oriental in distribution. All of the included species have been reared solely from bamboo stumps.

Included species: *albotaeniatus* (Leicester), *a. var. mikiranus* Edwards, *lepchana* Barraud (possibly a synonym of *albotaeniatus*), *stevensoni* (Barraud), and the new Philippine species described in this paper.

Division II—papuensis. Distinct on the nature of the scutal scaling. Scutum marked with either a large area or a median longitudinal stripe of pale scales (either silvery white or golden) on the anterior two-thirds, this pale area sharply delimited from the surrounding dark scaled areas, all of the scutal scales uniform in size and arrangement. Also: male palpi as in Division I; hind tarsi with broad basal bands on at least the first four segments (sometimes all five), no apical pale scaling; vertex with dorsal scales narrow; basistyle without a tuft of scales on the inner sternal surface; and, Australasian in distribution.

Included species: *anggiensis* Bonne-Wepster (not seen, possibly does not belong to this division), *argenteitarsis* Brug, *clintoni* Taylor (not seen, but possibly a synonym of *hollandius*), *derooki* Brug, *dobodurus* King and Hoogstraal, *hollandius* K. and H., *novalbitarsis* K. and H. (n. n. for *albitarsis* Taylor), *palmarum* Edwards, *papuensis* (Taylor), and *subalbitarsis* K. and H.

This division was first created by King and Hoogstraal (1946), and called the "*papuensis* group." From the division, as treated by them, *auridorsum* Edwards and *australienensis* (Theobald) have been excluded on the nature of the scutal scaling.

Division III—simlensis. As in Division I, except that the basistyle lacks a mesal tuft of modified scales.

Included species: *albocinctus* (Barraud), *gilli* (Barraud), and *simlensis* Edwards. The Korean species *scoulensis* Yamada was placed in the *gubernatoris* group by Edwards (1932), but on the basis of the markings of the hind tarsi I believe it should be placed in the *albotaeniatus* group; where it would probably fall in this division. However, this cannot be definitely determined until the male is known.

Division IV—purpureus (Molpemyia). Distinctive on general habitus. Large species, resembling *Megarhinus* in the large brush-like female pal-

pi, and in the strong metallic luster of the body scales; scutum with several restricted silvery markings, which are characterized by being largely made up of rather broad plate-like scales; males unknown; dorsum of vertex narrow scaled; femora as in Division I; first three hind tarsal segments basally banded; and, Australasian in distribution.

Included species: *pecuniosus* Edwards (synonym of *pecuniosus: hamadryadis* Cooling), *priestleyi* (Taylor), and *purpureus* (Theobald). According to Taylor (1944), *pecuniosus* is a synonym of *purpureus*.

Division V—subsimilis. Male palpi with terminal segments neither particularly modified, nor bearing hair tufts; scutum all dark scaled; and, first four hind tarsal segments basally banded. Otherwise as in Division III.

Included species: *subsimilis* (Barraud). This is apparently the only species in Group F which has the claspette appendage needle-like instead of blade-like.

Division VI—alboannulatus. Distinctive because of the pale scales sprinkled anteriorly on the femora and sometimes on the tibiae. Male palpi as in Division I; dorsum of vertex with narrow scales; scutal scaling not as in Division II; the first four hind tarsal segments basally banded; and, Australasian in distribution.

Included species: *alboannulatus* (Macquart), *a. var. milsoni* (Taylor), *occidentalis* (Skuse) (synonyms of *occidentalis: cumpstoni* Taylor, *demansis* Strickland, *queenslandis* Strickland, and *similis* Strickland).

Division VII—auronitens. Male palpi with terminal segments not modified, and not bearing hair tufts; dorsum of vertex with narrow scales; scutal scaling not as in Division II; femora not pale-speckled anteriorly; first three to four hind tarsal segments banded basally, sometimes a few pale scales apically; basistyle without scale tufts; and, Oriental in distribution.

Included species: *auronitens* Edwards, and *christophersi* Edwards.

Division VIII—australiensis. Male palpi as in Division I; dorsum of vertex with narrow scales; scutal scaling not as in Division II; femora not speckled anteriorly with pale scales; first three to four hind tarsal segments basally banded; and, Australasian and American in distribution.

Included species: *zoosophus* Dyar and Knab (U.S.A.) (synonym of *zoosophus: alleni* Turner), *australiensis* (Theobald), *auridorsum* Edwards, *biocellatus* Taylor, and *mackerrasi* Taylor.

This division is separable from Division VII on the possession of scales on the paratergite (this character not known for *mackerrasi*, however).

Only one of Edwards' (1932) originally included species

has been omitted from the group, *quasirubithorax* (Theobald). This has been done on the basis of its scutal markings, which consist of narrow pale longitudinal pale lines.

KEY TO THE DIVISIONS OF GROUP F

1. Vertex with dorsum largely broad scaled 2
Vertex with dorsum largely narrow scaled 4
2. Scutum dark scaled (*subsimilis*) Division V
Scutum with pale markings 3
3. Basistyle with a prominent tuft of elongate broadened scales arising from the inner sternal surface (*albotaeniatus*)..... Division I
Basistyle without an inner scale tuft (*simlensis*)..... Division III
4. Large species, resembling *Megarhinus* in the large brush-like female palpi, and in the strong metallic luster of the body scaling; scutellar scales broad, silvery white; several restricted silvery scutal marking which are characterized by being largely made up of rather broad platelike scales (males not known) (*purpureus*) Division IV
Not with the above combination of characters 5
5. Femora, and sometimes the tibiae, heavily speckled anteriorly with pale scaling (*alboannulatus*) Division VI
Neither femora nor tibiae speckled anteriorly with pale scaling.... 6
6. Scutum marked with either a large area or a median longitudinal stripe of pale scales (either silvery white or golden) on the anterior two-thirds, this pale area sharply delimited from the surrounding dark scaled areas, all the scutal scales uniformly very small and evenly arranged (*papuensis*)..... Division II
Scutum with the anterior half largely pale scaled (or at least not with a pale area that is sharply set off from the dark scaled background), the scales generally lying unevenly in some areas, and consisting of more than one size scale, the margins of the pale scaled area seldom sharply defined..... 7
7. Male palpi with terminal segments scarcely modified or decurved, and only very sparsely haired (not with pronounced tufts); paratergite bare (*auronitens*) Division VII
Male palpi with prominent hair tufts on the apical segments; paratergite scaled (this character not known for *mackerrasi*) (*australiensis*) Division VIII

***Aedes (Finlaya) harperi*, new species**

(Figs. 1, 2, and 3)

ADULT. *Male*. Wing approximately 2.5 to 2.7 mm. in length. *Head*.—Proboscis equal to the front femur in length; black, marked with a broad complete white band just beyond the middle and with a few ventro-apical white scales. Palpus longer than the proboscis by about one-half the length of the apical segment; black; the apex of segment III upturned, segments IV and V somewhat concave medially and both depressed from the plane of III; numerous long yellowish ventro-lateral

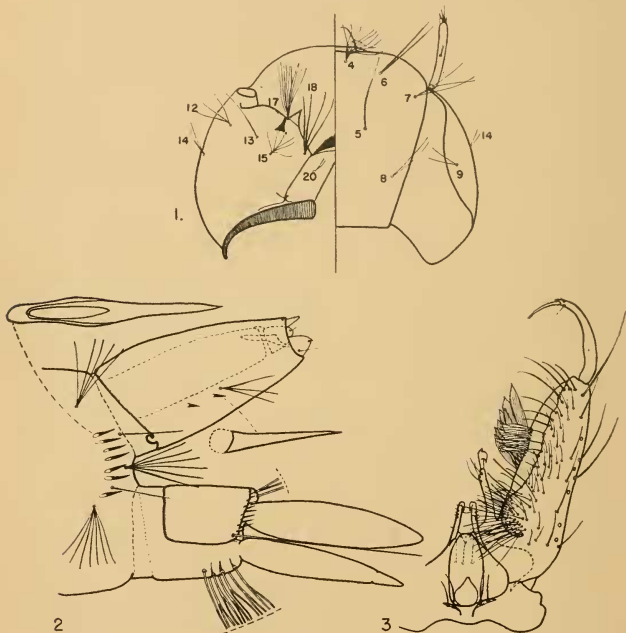
hairs from the apex of III, and all along IV and V. Torus bare. Vertex with broad scales, dark except for a white line along either side of the midline and along the eye margins (this latter line broadened laterally and consisting of narrowed scales), a narrow band of short dark upright forked scales on the nape and another near the ocular margin.

Thorax.—Scutal integument dark brown; no acrostichal bristles, a few posterior dorsocentrals and some presentellars however; densely clothed with small narrow and narrow-curved scales, these dark except for a large rectangular white area just before the wing base and a white median stripe that tapers posteriorly to the beginning of the prescutellar bare space, where it broadens into a patch of white scales (this latter area rubbed on holotype). Scutellum with a small patch of broad white scales on the mid lobe, a few narrow pale and dark scales on the lateral lobes. *Apn* with a small patch of broad white scales; *ppn* almost completely covered with broad white scales (2 bristles present). Following pleural areas each with a patch of broad white scales: proepisternum, prealar (below the knob; connected with the upper sternopleural patch), upper sternopleural, ventro-posterior sternopleural (usually connected with the upper patch), and mesepimeron. About 2 postspiracular bristles. Fore coxa with white scales above, dark scales below; mid coxa bare of scales; hind coxa with a small patch of white scales. Fore femur with anterior surface dark, a few sub-basal ventral pale scales may be present; posterior surface with slightly less than apical one-half white scaled, this extending onto the ventral surface. Mid femur dark, anterior surface with a ventral white area on the apical two-fifths, this continued across the ventral margin and repeated on the posterior surface. Hind femur dark, marked with a complete broad white band just before the middle and with a wide ventro-apical white area that encroaches well onto both the anterior and posterior surfaces. Fore tibia white, a complete longitudinal dark band anteriorly, also dorsally except at apex; mid and hind tibiae dark except for a ventro-basal white area that extends slightly onto the anterior and posterior surfaces. Fore tarsus dark, marked with a small basal white patch on II (may be all dark); mid tarsus with basal white bands on I-II, sometimes basal white scales on III; hind tarsus with broad basal white bands on I-IV, that on IV incomplete ventrally, a few pale scales may occur at the base of V, sometimes a very few apical white scales on I-II. Fore and mid tarsal claws unequal, the larger tooth bidentate, the smaller unidentate; hind claws equal, simple. Wing with a ventro-basal line of white scales on the costa; bases of fork cells approximately on a level; crossvein 4-5 slightly over twice its length basally removed from crossvein 3-4. Halter stem pale, knob black scaled.

Abdomen.—Tergites black; I with a broad lateral white band; III-V with a complete basal white band, slightly narrowed medially; VI-VII with a baso-lateral white patch; II-VI strongly compressed laterally. Sternites III-VII with broad basal white bands. *Genitalia* (Fig. 3):—Inner tergal surface of basistyle with a well developed basal lobe, this

bearing a large number of setae; margin of inner sternal surface with an elongate group of stout pale setae and a clump of elongate broad yellowish scales. Apex of mesosome with a group of small erected papillae. Claspette stem with 2 large setae and about 2 small ones; blade with a dorsal crest. Ninth tergite lobes each with 2 broadened setae. Ninth sternite with a pair of stout setae and one small hair.

Female. Wing approximately 2.9 mm. in length. Largely similar to the male. However: proboscis with white band incomplete dorsally, ventrally occupying nearly one-half of the length of the proboscis. Palpus approximately one-third the length of the proboscis. Median white area of vertex confined to the anterior one-half. Scutum with median white



EXPLANATION OF FIGURES

Fig. 1. *Aedes (Finlaya) harperi*. Larval head (mouth parts omitted): half ventral, right half dorsal.

Fig. 2. *A. harperi*. Lateral aspect of larval terminal segments.

Fig. 3. *A. harperi*. Tergal aspect of male genitalia.

line confined to a small wedge-shaped patch on the anterior margin, only a few white scales at the prescutellar bare space. Tarsal claws equal, fore and mid each unidentate, hind simple. Tergite VIII all white scaled.

LARVA (description and figures from larval skins only). *Head* (Fig. 1):—Antenna smooth; antennal hair tuft very short, with 2 stiff parallel divisions. Hair 4 with 9-10 branches; 5 with 1-2; 6 with 2; 7 with 2-3; 8 with 2; 9 with 2-3; 12 with 3; 13 single; 14 with 2; 15 with 6-7; 17 with 10-11 (elongate, stellate); 18 with 4 (stellate); 20 double. Mentum with about 12 lateral teeth.

Thorax.—Numerous thin stellate hairs present. Prothoracic hair 9 stellate, with about 10 branches; 10 and 12 elongate, single; 11 short, single. Mesothoracic hair 9 large, double; hairs 10 and 12 elongate, single (12 with slighter diameter than 10); hair 11 not seen. Metathoracic hairs 9 and 10 as with mesothorax; 11 very short, with 1-3 branches; 12 slender, single, distinctly shorter than 10.

Abdomen (Fig. 2):—Numerous thin stellate hairs present. Dorsolateral hair of I-II with 2 branches; lateral hair of I-II single, of III-V double. Pentad hairs 1, 3, and 5 with about 5-8 branches; hairs 2 and 4 single. Comb consisting of a row of 6-9 large stout dark spines, a very fine fringe present basally. Siphon short, broad, dark; hair tuft with 2-3 branches; pecten with 2-3 acutely-tapered teeth, a few very fine fringe elements ventro-basally. Anal plate with a posterior fringe of slender spines, some of these ventral to *lh*; *lh* single; *isc* double. Ventral brush composed of 8 tufts, all except the basal one arising from a barred area, each tuft with 2 branches. Anal gills broad, elongate-lanceolate; dorsal pair slightly longer than the ventral and approximately twice the length of the anal plate.

Holotype.—Male (No. 1118.9), with associated larval and pupal skins and mounted genitalia (U.S.N.M. Cat. No. 58523), Zig-Zag Pass, Subic Bay, Zambales Province, Luzon Island, Philippines, August 13, 1945 (L. E. Rozeboom and M. J. MacMillan), reader from a bamboo stump.

Paratypes.—Two males, 1 female, 1 set of adult-associated larval and pupal skins, Olongapo, Subic Bay, Zambales Province, Luzon Island, July 4, 1945, reared from bamboo stump; 1 female, Matain, Subic Bay, Zambales Province, Luzon Island, July 16, 1945, reared from cut bamboo. Collectors: L. E. Rozeboom, M. J. MacMillan, and E. S. Zolik. Paratypes deposited in the U. S. National Museum.

REMARKS. This species, which is a member of Division I, is closely related to *stevensoni* (Barrand). However, the latter species differs as follows: vertex without a white median area; only the first 3 hind tarsal segments banded (sometimes a trace of a marking on IV); female tergites without complete bands except VIII, which is all white; and, basal white scaled area on costa very small.

Both *harperi* and *stevensoni* are separable from *albotaeniatus* and *a. var. mikiranus* on the scutal markings. The scutum of *albotaeniatus* is all white scaled before the wing bases except for a large lateral spot in the area of the scutal angle. The scutum of *mikiranus* has a white patch before each wing base, but the remainder is dark scaled except for a very thin median longitudinal pale line that forks at the prescutellar area, and an indistinct sub-dorsal line. Also, these two species each have a scale patch on both the postspiracular and subspiracular areas, whereas in *harperi* and *stevensoni* these areas are without scales.

A specimen of the new species has been compared with the types of *stevensoni*, *albotaeniatus*, *lepchana*, and *a. var. mikiranus*.

The larva of *stevensoni* and *a. var. mikiranus* are unknown, and that of *albotaeniatus* has been described only from a drawing of a specimen from the Federated Malay States (Edwards, in Barraud, 1934). It differs from the larva of *harperi* as follows: comb composed of about 14 teeth in a patch; siphon six times as long as the diameter of the base, tapered on distal one-third only; and, pecten composed of about 10 teeth, with one widely detached.

It seems likely that *harperi* may prove to be only a geographical subspecies of *stevensoni*, but determination of this point cannot be accomplished until more collecting is done in the intervening areas.

This species is dedicated to Dr. Paul A. Harper who, as a member of the U. S. Army Medical Corps, did so much to further malaria control work in the South Pacific during the war.

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